U.S. Department
of Transportation

**Research and
Special Programs
Administration**

APR 22 1999

400 Seventh Street, S.W.
Washington, D.C. 20590

DOT-E 12196
(FIRST REVISION)

EXPIRATION DATE: March 31, 2001

(FOR RENEWAL, SEE 49 CFR § 107.109)

1. GRANTEE: HR Textron Inc.
Pacoima, CA

2. PURPOSE AND LIMITATIONS:

a. This exemption authorizes the manufacture, marking, sale and use of a non-DOT specification stainless steel alloy cylinder conforming with all regulations applicable to a DOT specification 3AA cylinder, except as specified herein, for the transportation in commerce of the materials authorized by this exemption. This exemption provides no relief from the Hazardous Material Regulations (HMR) other than as specifically stated herein.

b. The safety analyses performed in development of this exemption only considered the hazards and risks associated with transportation in commerce. The safety analyses did not consider the hazards and risks associated with use as a component of a transport vehicle or other device, or other uses not associated with transportation in commerce.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.302(a) and 175.3 in that a non-DOT specification cylinder is not authorized, and §§ 173.34(e), 178.35, and 178.37 as modified herein.

5. BASIS: This exemption is based on the application of HR Textron Inc., dated December 11, 1998, submitted in accordance with 49 CFR § 107.105 and the public proceeding thereon, and a supplemental letter dated April 19, 1999.

6. HAZARDOUS MATERIALS (49 CFR § 172.101):

Proper Shipping Name/ Hazardous Material Description	Hazard Class/ Division	Identification Number	Packing Group
Nitrogen, compressed	2.2	UN1066	N/A
Nitrogen, mixtures with rare gases	2.2	UN1981	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING - Packaging prescribed is a welded non-DOT specification cylinder having a maximum capacity of 50 cubic inches, constructed of 15-5 precipitation hardened (PH) stainless steel. The cylinder must be in conformance with HR Textron Drawing 803360, Rev. A, on file with the Office of Hazardous Materials Exemptions and Approvals (OHMEA). The cylinder must conform to the requirements of DOT Specification 3AA (§§ 178.35, and 178.37) except as follows:

§ 178.35(a) *Compliance.* Required in all details except as amended herein.

§ 178.35(e) Safety Devices. Each cylinder must be equipped with a valve containing a frangible disc type safety device. Each frangible disc must have a rated bursting pressure which does not exceed 90 percent of the minimum required test pressure of the cylinder. Discs with fusible metal backing are not permitted.

§ 178.35(f) *Marking.*

(1) * * *

(i) Instead of DOT-3AA, each cylinder must be marked "DOT E 12196" followed by the service pressure.

§ 178.35(g) *Inspectors Report.* Inspector's report must be appropriately modified to reflect identification, and conformance with this exemption. A copy of the inspector's report on the first lot of cylinders produced must be submitted to OHMEA prior to initial shipment.

§ 178.37(a) *Type, Size and Service Pressure.*

(1) Welded stainless steel cylinders not over 1.8 pounds water capacity, and maximum service pressure is 3,000 psig at 70°F.

(2) Deleted

§ 178.37(b) *Authorized Steel.* Authorized material must be 15-5 PH stainless steel alloy. Material must conform to SAE Aerospace Material Specification (AMS) 5659H, with the following chemical composition:

Element	min.	max.
Carbon	--	0.07
Manganese	--	1.00
Silicon	--	1.00
Phosphorous	--	0.030
Sulfur	--	0.015
Chromium	14.00	15.50
Nickel	3.50	5.50
Columbium	5xC	0.45
Copper	2.50	4.50
Molybdenum	--	0.50
Tantalum	--	0.05

Check Analysis must conform to AMS 5659, Paragraph 3.1, Table 1.

§ 178.37(e) *Welding or brazing.* All seams of the cylinder must be fusion welded using electron beam welding with complete penetration of the joint. Openings in the packaging which are not integrally forged or machined must be provided with a fitting or boss of compatible stainless steel alloy attached to the cylinder by fusion welding.

Radiographic inspection of welds before heat treat must be performed. Accept/reject criteria must be in accordance with x-ray standards for production, and repair welds (NAVSHIPS 250-692-2), Bureau of Ships, Navy Department, Washington, DC.

§ 178.37(g) *Heat treatment.* After welding, and x-ray, the completed cylinder must be uniformly, and properly heat treated prior to tests. Heat treatment of the cylinders of the authorized analysis must be as follows:

(1) Solution heat treat to Condition "A" followed by age hardening to condition 1025 in accordance with MIL-H-6875.

(2) After heat treat, all cylinders must be externally inspected by the dye penetrant inspection method to detect the presence of cracks. Any cylinder found to have a crack must be rejected, and may not be requalified. Evidence of discontinuities, which in the opinion of the independent inspector, may appreciably weaken or decrease the durability of the pressure vessel must be cause for rejection.

§ 178.37(j) *Flattening Test.*

(1) The flattening test on each production lot is not required.

(2) A flattening test on one cylinder of each new design must be in accordance with this section.

§ 178.37(k) *Physical Tests.*

(3) * * *

(ii) Applies except that the elastic extension calculations must be based on an elastic modulus of 28,500,000.

§ 178.37(l) *Acceptable results for Physical and Flattening Tests.*

(1) Physical tests

(i) Elongation in the transverse direction (circumferentially) 8 percent minimum for a gauge length of 24t, and width of 6t. Reduction in area must be recorded.

(ii) Ultimate tensile strength is 155,000 psi minimum, yield strength is 145,000 psi minimum.

b. TESTING - Each cylinder must be reinspected and hydrostatically retested every five years in accordance with § 173.34(e) as prescribed for DOT-3AA cylinders except that determination of permanent expansion is not required. Evidence of leakage or bulging through the circumferential weld seam must be reason for cylinder rejection. No repairs to the cylinder are authorized.

c. DESIGN QUALIFICATION TESTS - Each new cylinder design must have a minimum burst pressure of 3.0 times service pressure and be tested as follows:

(1) Four (4) cylinders must be subjected to a burst test.

(i) Three cylinders must be subjected to 50,000 pressure cycles from 10 percent of service pressure to service pressure at a rate not to exceed 10 cycles per minute.

(ii) The cylinders must withstand the pressure cycles without any evidence of visually observable leakage or damage, which in the opinion of the Independent Inspector may have an adverse effect on the integrity of the cylinder. After successfully passing the cycling test, the three cycled cylinders and the uncycled cylinder must be burst. Pressure must be increased to failure at a rate not to exceed 200 psi per second. The pressure at the onset of failure shall be recorded, as well as the burst pressure.

(iii) Cylinders that burst at over twice the hydrostatic test pressure may separate in two parts in the circumferential weld area.

(2) Burst tests are not required on each production lot.

8. SPECIAL PROVISIONS:

a. In accordance with the provisions of Paragraph (b) of 49 CFR § 173.22a, persons may use the packaging authorized by this exemption for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this exemption.

b. A person who is not a holder of this exemption, but receives a package covered by this exemption, may reoffer it for transportation provided no modifications or changes are made to the package and it is offered for transportation in conformance with this exemption and the HMR.

c. A current copy of this exemption must be maintained at each facility where the package is offered or reoffered for transportation.

d. Each packaging manufactured under the authority of this exemption must be either (1) marked with the name of the manufacturer and location (city and state) of the facility

at which it is manufactured or (2) marked with a registration symbol designated by the Office of Hazardous Materials Exemptions and Approvals for a specific manufacturing facility.

e. A current copy of this exemption must be maintained at each facility where the package is manufactured under this exemption. It must be made available to a DOT representative upon request.

f. Cylinders are limited to use as part of aircraft emergency door actuation systems or pneumatic services on missiles as described in the HR Textron Inc. application.

g. Cylinders must be shipped in strong outside packaging in accordance with § 173.301(k).

h. Cylinder service life may not exceed 35 years.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo aircraft, and passenger-carrying aircraft.

10. MODAL REQUIREMENTS: A current copy of this exemption must be carried aboard each aircraft used to transport packages covered by this exemption. The shipper must furnish a copy of this exemption to the air carrier before or at the time the shipment is tendered.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this exemption and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

- All terms and conditions prescribed in this exemption and the Hazardous Materials Regulations, Parts 171-180.
- Registration required by § 107.601 et seq., when applicable.

Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this exemption must receive training on the requirements and conditions of this exemption in addition to the training required by §§ 172.700 through 172.704.

No person may use or apply this exemption, including display of its number, when this exemption has expired or is otherwise no longer in effect.

12. REPORTING REQUIREMENTS: The carrier is required to report any incident involving loss of packaging contents or packaging failure to the Associate Administrator for Hazardous Materials Safety (AAHMS) as soon as practicable.

(Sections 171.15 and 171.16 apply to any activity undertaken under the authority of this exemption.) In addition, the holder(s) of this exemption must also inform the AAHMS, in writing, as soon as practicable of any incidents involving the package and shipments made under this exemption.

Issued at Washington, D.C.

Ann Mazzullo APR 22 1999

Alan I. Roberts (DATE)
Associate Administrator for
Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Research and Special Programs Administration, Department of Transportation, Washington, D.C. 20590. Attention: DHM-31.

The original of this exemption is on file at the above office. Photo reproductions and legible reductions of this exemption are permitted. Any alteration of this exemption is prohibited.

Copies of exemptions may be obtained from the AAHMS, U.S. Department of Transportation, 400 7th Street, S.W., Washington, DC 20590-0001, Attention: Records Center, 202-366-5046.

Dist: FAA, FHWA, FRA
PO: SS/am